Molecular Dications and the Auroral Mystery Feature: Measurements on Nitrogen

A.N. DAW, S.M. BREWER, C.C. ESTES, J.A. KANOY, B.W. MYER, A.G. CALAMAI, Appalachian State University — Experiments in progress at the ASU ion trapping facility will provide atomic and molecular data for \( N^+ \), \( N_2^+ \), and \( N_2 \), specifically, measurements of: the radiative lifetime of the \( 5\text{S} \) metastable level of \( N^+ \), the dissociation rate of \( N_2^+ \), electron capture rates from molecular nitrogen for both these ions, and the cross section for dissociative electron impact ionization of molecular nitrogen into metastable \( 5\text{S} \) \( N^+ \). Ions are created in a radiofrequency ion trap by electron bombardment on nitrogen gas, and both the number of stored ions and the UV radiation emitted by the stored ion population (from decaying metastable \( N^+ (5\text{S}) \) ions and \( N_2^+ + N_2 \) reactions) are measured as a function of time. Preliminary data and results will be presented.

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